

AMENDMENTS TO THE CLAIMS

Please amend claims 1, 11, 16, 21, 43, and 44, and cancel claim 2 such that the status of the claims is as follows:

1. (Currently Amended) A method for making a three-dimensional object comprising the steps of:

providing an object built from a polymeric or wax modeling material using a ~~layered manufacturing rapid prototyping~~ fused deposition modeling technique, wherein the built object has an object surface formed of the modeling material, wherein at least a portion of the object surface has at least one surface effect due to the ~~layered manufacturing rapid prototyping~~ fused deposition modeling technique, wherein the at least one surface effect extends substantially across an entirety of the object surface, ~~and~~ wherein the at least one surface effect is selected from the group consisting of a stair step effect, striation, a roughness due to errors in building the object, and a combination thereof, and wherein the object exhibits porosity due to the fused deposition modeling technique;

exposing the object to vapors of a solvent that transiently softens the modeling material at the object surface; and

reflowing the softened modeling material to reduce the at least one surface effect and to reduce the porosity of the object at the object surface.

2. (Canceled)

3. (Previously Presented) The method of claim 1, where the modeling material comprises a thermoplastic resin.

4. (Original) The method of claim 3, wherein the thermoplastic resin comprises at least about 50 weight percent of an amorphous thermoplastic selected from the group consisting of ABS, polycarbonate, polyphenylsulfone, polysulfone, polystyrene, polyphenylene ether, amorphous polyamides, acrylics, poly(2-ethyl-2-oxazoline), and blends thereof.

5. (Original) The method of claim 4, wherein the solvent is selected from the group consisting of methylene chloride, an n-Propyl bromide solution, perchloroethylene, trichloroethylene, and a hydrofluorocarbon fluid.

6-7. (Canceled)

8. (Previously Presented) The method of claim 1, and further comprising the step of:
selecting a length of time during which the object is to be exposed to the solvent vapors as a function of concentration of the solvent vapors, prior to the exposing step.

9. (Canceled)

10. (Previously Presented) The method of claim 1, and further comprising the step of:
masking selected portions of the object surface with a substance that will inhibit smoothing of the selected portions, prior to the step of exposing the object to the vapors of the solvent.

11. (Currently Amended) The method of claim 1, and further comprising building the object using the ~~layered manufacturing rapid prototyping~~ fused deposition modeling technique.

12-15. (Canceled)

16. (Currently Amended) The method of claim 1, ~~and further comprising:~~ wherein reflowing the softened modeling material to reduce the porosity of the object at the object surface comprises eliminating the porosity of the object at the object surface.

~~re-exposing the object to the vapors of the solvent to transiently resoften the modeling material at the object surface; and
reflowing the resoftened modeling material to eliminate the surface effect.~~

17. (Canceled)

18. (Previously Presented) The method of claim 1, and further comprising the step of:

suspending the object in a vessel containing the vapors of the solvent in a manner that substantially allows the entirety of the object surface to be exposed to the vapors of the solvent.

19. (Previously Presented) The method of claim 1, wherein exposing the object to vapors of the solvent transiently softens the modeling material substantially across the entire object surface, and wherein reflowing the softened modeling material reduces the surface effect substantially across the entire object surface.

20. (Previously Presented) The method of claim 1, and further comprising the steps of:

providing an initial object representation in a digital format, the initial object representation having a surface geometry; and
modifying the initial object representation to pre-distort certain features of the surface geometry, producing a modified object representation;
wherein the object built in the building step has a geometry defined according to the modified object representation; and
wherein the desired geometry attained following the exposing step approximately matches that of the initial object representation.

21. (Currently Amended) A method for making a three-dimensional object comprising the steps of:

providing an object built from a plurality of layers with a modeling material using a ~~layered manufacturing rapid prototyping~~ fused deposition modeling technique, wherein the object has an object surface, and wherein the plurality of layers create at least one surface effect extending substantially across an entirety of the object surface, the at least one surface effect being selected from the group consisting of a stair step effect, striation, a roughness due to errors in building the object, and a combination thereof, and wherein the object exhibits porosity due to the fused deposition modeling technique;

exposing the object to vapors of a solvent that transiently softens the modeling material at the object surface; and

reflowing the softened modeling material to reduce the at least one surface effect substantially across the entirety of the object surface and to reduce the porosity of the object at the object surface.

22. (Previously Presented) The method of claim 21, where the modeling material comprises a thermoplastic resin.

23. (Original) The method of claim 22, wherein the thermoplastic resin comprises at least about 50 weight percent of an amorphous thermoplastic selected from the group consisting of ABS, polycarbonate, polyphenylsulfone, polysulfone, polystyrene, polyphenylene ether, amorphous polyamide, methyl methacrylate, poly(2-ethyl-2-oxazoline), and blends thereof.

24-26. (Canceled)

27. (Original) The method of claim 21, and further comprising the step of:

masking selected portions of the object surface with a substance that will inhibit smoothing of the selected portions, prior to the step of

reflowing the surface.

28. (Previously Presented) The method of claim 27, wherein the masking substance is applied using an automatic process selected from the group consisting of a jetting process and a fused deposition modeling process.

29-32. (Canceled)

33. (Previously Presented) The method of claim 21, wherein the solvent is selected from the group consisting of methylene chloride, an n-Propyl bromide solution, perchloroethylene, trichloroethylene, a hydrofluorocarbon fluid, and combinations thereof.

34-42. (Canceled)

43. (Currently Amended) A method for treating a three-dimensional object built with a modeling material using a ~~layered manufacturing rapid prototyping~~ fused deposition modeling technique, the method comprising:

providing the three-dimensional object to a vessel configured to contain vapors of a solvent, wherein substantially an entire exterior surface of the three-dimensional object comprises at least one surface effect caused by the ~~layered manufacturing rapid prototyping~~ fused deposition modeling technique, wherein the at least one surface effect is selected from the group consisting of a stair-step effect created by layering of a plurality of layers of the modeling material, striation created by formation of roads of the modeling material, surface roughness created by errors in the building of the three-dimensional object, and a combination thereof, and wherein the object exhibits porosity due to the fused deposition modeling technique;

placing the three-dimensional object in the vessel in a manner that exposes substantially the entire exterior surface of the three-dimensional object

to the vapors of the solvent, wherein the vapors of the solvent transiently soften the modeling material across the entire exposed exterior surface of the three-dimensional object; and
reflowing the softened modeling material to reduce the at least one surface effect across the entire exposed exterior surface and to reduce the porosity of the object at the object surface.

44. (Currently Amended) The method of claim 43, wherein ~~the layered manufacturing rapid prototyping technique used to build the three-dimensional object comprises fused deposition modeling~~ reflowing the softened modeling material to reduce the porosity of the object at the object surface comprises eliminating the porosity of the object at the object surface.

45. (Previously Presented) The method of claim 43, where the modeling material comprises a thermoplastic resin.

46. (Previously Presented) The method of claim 45, wherein the thermoplastic resin is selected from the group consisting of ABS, polycarbonate, polyphenylsulfone, polysulfone, polystyrene, polyphenylene ether, amorphous polyamides, acrylics, poly(2-ethyl-2-oxazoline), and blends thereof.

47. (Previously Presented) The method of claim 43, wherein the solvent is selected from the group consisting of methylene chloride, an n-Propyl bromide solution, perchloroethylene, trichloroethylene, a hydrofluorocarbon fluid, and combinations thereof.

48. (Previously Presented) The method of claim 43, wherein placing the three-dimensional object in the vessel comprises suspending the three-dimensional object in the vessel.

49. (Previously Presented) The method of claim 43, and further comprising masking selected portions of the exterior surface with a substance that will inhibit smoothing of the selected portions.